

MTCA/SMS INTEGRATION TERMS & DEFINITIONS

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TERMINOLOGY

- The 10-year timeframe should be removed from the cleanup goal definition (I agree with Teresa's comments on this).
- I recommend that we change the term "maximum allowable level" (with the unfortunate acronym MAL) to "maximum sediment cleanup level" (MSCL).
- You need to restore the crossed out implementability, cost, community concerns, recycling, and environmental benefit criteria to the FS evaluation criteria, as many of these criteria are not only fundamental to the MTCA evaluation, but also have been demonstrated to be integral to SMS evaluation identifying appropriate sediment cleanup remedies (I'm hoping the elimination of these criteria was just a typo).
- The definition of "sediment" should include a reference to "waters of the state" and specifically exclude treatment facilities.
- The term "active cleanup action" should be deleted from the terminology, similar to what EPA has done in their national sediment remediation guidance.
- Based on the considerable body of information that is now available, the biologically active zone in sediments should generally be defined as a default value of 10 cm for both marine and freshwater sediments (consistent with current practice), subject to site-specific refinements where appropriate. Some additional supporting thoughts and references:
 - The depth of the surface layer is dependent on: a) the depth to which significant mixing exists; and b) the depth to which sediment scour occurs.
 - The evidence for a 10 cm biologically active zone in Puget Sound marine sediments is now overwhelming, with very few localized exceptions.
 - For freshwater sediments, a large number of published studies have demonstrated that chironomids and oligochaetes (which generally dominate freshwater benthos) burrow to depths of about 8 to 10 cm, but most reside closer to the surface. Non-feeding individuals (i.e., over-wintering) can burrow deeper, but there is no evidence that this behavior causes substantive sediment mixing. See the following studies:
 - Teal et al. (2008) - Global mean mixed depth of 6 cm
 - Matisoff and Wang (2000) - Maximum sediment mixing by Chironomus sp. at depth of 5 cm
 - Charbonneau and Hare (1998) - Mean burrowing depth for Chironomus sp. in muddy sediments of 5 cm
 - White et al. (1987) - Little sediment re-working by oligochaetes at 4 degrees C
 - Krezoski et al. (1978) - Some mixing by oligochaetes down to 3 cm in lake sediment core, with peak abundance occurring at 1 to 3 cm
 - Milbrink (1973) - Most chironomids concentrated in upper 2 to 4 cm of lake mud. Tubificids penetrated lake muds to 15 cm, with maximum abundance observed at 2 to 4 cm
 - Hilsenhoff (1966) - Feeding individuals located within 8 cm of surface